Catalyzing next-generation Artificial Intelligence through NeuroAI

Abstract

One of the ambitions of computational neuroscience is that we will continue to make improvements in the field of artificial intelligence that will be informed by advances in our understanding of how the brains of various species evolved to process information. To that end, here the authors propose an expanded version of the Turing test that involves embodied sensorimotor interactions with the world as a new framework for accelerating progress in artificial intelligence. Neuroscience has long been an essential driver of progress in artificial intelligence (AI). We propose that to accelerate progress in AI, we must invest in fundamental research in NeuroAI. A core component of this is the embodied Turing test, which challenges AI animal models to interact with the sensorimotor world at skill levels akin to their living counterparts. The embodied Turing test shifts the focus from those capabilities like game playing and language that are especially well-developed or uniquely human to those capabilities – inherited from over 500 million years of evolution – that are shared with all animals. Building models that can pass the embodied Turing test will provide a roadmap for the next generation of AI.